

CLAIMS

- Sub 5 1. In a telecommunications transmission system using a DTM system as multicarrier system and having at least two VDSL systems, each comprising a pair of modems, said at least two VDSL systems belonging to a single binder group common to both VDSL systems, a method in said DMT system for keeping 10 DMT frames aligned to the same frame timing characterised by the steps of
- estimating the time mis-alignment and power of cross-talk DMT signals added to a received DMT signal when the estimate is used by the modem to synchronise its own frame timing to a main cross-talkers frame timing and
 - 15 - that auto-correlation is used on the received signal and a delayed copy of the received signal and
 - 20 - that correlation maxima detects that determine the frame boundaries of different DMT components of the received signal.
2. A method, as claimed in claim 1 characterised in that, the 25 method uses the inherent property of DMT signals and that part of the signal is correlated, in the time domain, in terms of cyclic extensions.

3. A method, as claimed in claim 1 **characterised in** that, the method further comprising the step that the time mis-alignment of the cross-talk signals estimates as the distance between the correlation maximum corresponding to the desired signal (known location) and other correlation maxima.

4. A method, as claimed in claim 3 **characterised in** that, the method further comprising the step that the amplitude of a correlation maximum is a relative measure of the power of the corresponding cross-talker.

5. A method, as claimed in claim 3 **characterised in** that, the method further comprising the step that when the time offset of the cross-talk is estimated at the VTU-O, this information will be used to adjust its clock and frame boundaries to align with the cross-talker and hence orthogonality is achieved and the distortion is minimized.

6 A method, as claimed in claim 3 **characterised in** that, the method further comprising the step that if the auto-correlation peak amplitude of the cross-talk signal is low the VTU-O can choose to not align clock and frame boundaries since the cross-talker then do not significantly contribute to the distortion and hence a threshold level will be used.

7. A method, as claimed as claimed in any previous claim **characterised in** that the presented method to estimate frame boundaries of cross-talkers can be used for several other

applications, e.g., NEXT cancellation algorithms and multi-user detection algorithms.

By counsel
8. A method, as claimed as claimed in any previous claim
5 **characterised in** that the presented method to estimate frame boundaries of cross-talkers every starting-up modem in a system uses this method result in that all modems that cause interference in each other's receivers will become aligned to the same frame timing.

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